

Notice of Allowability

Application No.

09/486,334

Examiner

Anne R. Kubelik

Applicant(s)

DROUX ET AL.

Art Unit

1638

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to response filed 10/4/04.
2. ☒ The allowed claim(s) is/are 6,9,16-19,26,35,37,39,41-42,48, 51-53,55,59,71,75,77-82, renumbered 2-8,16-20,10,21-24,26,9,13,15, 1,12,14,11 and 25, respectively.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Examiner's Amendment

1. The restriction among Groups I and III and Groups B-D, as detailed in the restriction mailed 5 June 2001 is withdrawn and the groups rejoined.
2. An extension of time under 37 CFR 1.136(a) is required in order to make an examiner's amendment that places this application in condition for allowance. During a telephone conversation conducted on 26 October 2004, Liza Hohenschutz requested an extension of time for 1 MONTH(S) and authorized the Commissioner to charge Deposit Account No. 03-2775 the required fee of \$110 for this extension and authorized the following examiner's amendment. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

IN THE CLAIMS:

Claims 10-11, 15, 20-23, 25, 31-33, 35-36, 38, 40, 43-47, 49-50, 54, 56-58, and 65 are cancelled without prejudice.

Claim 6 (currently amended): The method according to claim 78, wherein the serine acetyltransferase is overexpressed in the cytoplasm of the plant cells.

Claim 9 (currently amended): The method according to claim 62 6, wherein the serine acetyltransferase is SAT3, which is represented by SEQ ID NO:2.

Claim 16 (currently amended): ~~Method~~ The method according to claim ~~15~~ 6,
~~characterized in that wherein~~ the SAT serine acetyltransferase is SAT1', which is represented by
~~SEQ ID NO:3~~ SEQ ID NO:6.

Claim 17 (currently amended): The method according to claim 78, wherein the serine
acetyltransferase is overexpressed in the chloroplasts of the plant cells.

Claim 18 (currently amended): The method according to claim 17, wherein the serine
acetyltransferase is overexpressed in chloroplasts by integration[,] into chloroplast DNA of plant
cells[,] of a chimeric gene comprising a DNA sequence encoding the serine acetyltransferase;
~~wherein said DNA sequence is under the control of~~ operably linked to 5' and 3' regulatory
elements which are functional in chloroplasts.

Claim 19 (currently amended): The method according to claim 17, wherein the serine
acetyltransferase is ~~overexpressed in the cytoplasm in the form of a~~ chloroplast transit
peptide/serine acetyltransferase fusion protein, ~~wherein the mature functional serine~~
~~acetyltransferase is released inside the chloroplasts.~~

Claim 26 (currently amended): The method according to claim ~~25~~ 19, wherein the transit
peptide consists of a plant EPSPS transit peptide or a plant RuBisco ssu transit peptide.

Claim 34 (currently amended): ~~Chimeric~~ A chimeric gene comprising a nucleic acid encoding an Arabidopsis thaliana cysteine-insensitive serine acetyltransferase operably linked to heterologous 5' and 3' regulatory sequences that are functional in plants, ~~which are able to function in a host organism,~~ characterized in that ~~the coding sequence comprises at least one nucleic acid sequence which encodes an SAT.~~

Claim 37 (currently amended): ~~Chimeric~~ The chimeric gene according to claim 36 ~~34~~, characterized in that the 5' regulatory element comprises regulatory sequences which are promoters in plant cells and plants, and are ~~chosen~~ selected from the group consisting of leaf-specific promoters which are expressed in plant leaves, constitutive promoters, or seed specific promoters, and light-dependent promoters of bacterial, viral or plant origin.

Claim 39 (currently amended): ~~Chimeric~~ The chimeric gene according to claim 38 ~~37~~, wherein ~~characterized in that~~ the promoter is ~~chosen from the promoters~~ a promoter for napin, phaseolin, glutenin, zein, helianthinin, albumin and or oleosin.

Claim 41 (currently amended): ~~Chimeric~~ The chimeric gene according to claim 34, wherein ~~characterized in that~~ the nucleic acid sequence ~~which encodes an SAT is the~~ is operably linked to a nucleic acid sequence encoding a transit peptide/SAT fusion protein and that, wherein the SAT serine acetyltransferase is heterologous ~~with~~ to the transit peptide.

Claim 42 (currently amended): ~~Cloning and/or expression~~ A vector for transforming a host organism, ~~characterized in that it contains~~ wherein the vector comprises at least one chimeric gene as defined according to claim 34.

Claim 48 (currently amended): ~~Method~~ The method according to claim 47 ~~78~~, ~~characterized in that the host organism is a monocotyledonous plant, in particular chosen from~~ wherein the plant cells are from a monocotyledonous or a dicotyledonous plant ~~cereals, sugar cane, rice, and maize, or a dicotyledonous plant, in particular chosen from tobacco, soybean, rape, cotton, beet and clover.~~

Claim 51 (currently amended): ~~Plant~~ A plant cell, ~~characterized in that it comprises at least one nucleic acid sequence according to claim 33, or a~~ comprising the chimeric gene according to claim 34 ~~comprising a coding sequence as well as heterologous 5' and 3' regulatory sequences, which are able to function in a host organism, characterized in that the coding sequence comprises at least one nucleic acid sequence which encodes an SAT.~~

Claim 52 (currently amended): ~~Genetically~~ A genetically modified plant, ~~characterized in that is comprises~~ comprising at least one plant cell according to claim 51.

Claim 53 (currently amended): ~~Plant~~ A plant comprising the chimeric gene according to claim 34 ~~according to claim 52, characterized in that the plant is regenerated from a plant cell~~

~~and that it comprises at least one nucleic acid sequence encoding a transit peptide/SAT fusion protein, characterized in that the SAT is heterologous with the transit peptide.~~

Claim 55 (currently amended): ~~Genetically modified~~ The plant according to claim 52, characterized in that it is ~~a monocotyledonous plant, in particular chosen from wherein the plant is a monocotyledonous or a dicotyledonous plant cereals, sugar cane, rice, and maize, or a dicotyledonous plant, in particular chosen from tobacco, soybean, rape, cotton, beet and clover.~~

Claim 59 (currently amended): ~~Seeds~~ A seed of genetically modified plant[s] according to claim 52, wherein the seed comprises the chimeric gene.

Claim 71 (currently amended): The method of claim ~~25~~ 19, wherein said transit peptide is an optimized transit peptide (OTP) comprised of the sunflower RuBisCO ssu transit peptide ~~fused~~ operably linked to a peptide made of the twenty-two N-terminal amino acids of the mature maize RuBisCO ssu, which is in turn ~~fused~~ operably linked to the maize RuBisCO ssu transit peptide.

Claim 75 (currently amended): The method of claim 79, wherein said ~~nucleotide~~ nucleic acid encodes SAT3, which is represented by SEQ ID NO:2.

Claim 77 (currently amended): The method of claim 80, wherein said ~~nucleotide~~ nucleic acid encodes SAT3, which is represented by SEQ ID NO:2.

Claim 78 (currently amended): A method for increasing the production of cysteine, glutathione, methionine or sulfur-containing derivatives of methionine by plant cells, said method consisting of

transforming plant cells with a nucleic acid sequence encoding an *Arabidopsis thaliana* cysteine-insensitive serine acetyltransferase operably linked to heterologous 5' and 3' regulatory sequences that are functional in plants; and

optionally regenerating a transformed plant from said transformed plant cells,

whereby said transformed plant cells overexpress, or ~~optionally~~ said transformed plant overexpresses, serine acetyltransferase, resulting in an increase in production of cysteine, glutathione, methionine, or sulfur-containing derivatives of methionine by said transformed plant cells or plant in comparison with the level observed in nontransformed plant cells or in a plant of the same type as said transformed cells or plant.

Claim 79 (currently amended): A method for increasing the production of cysteine, glutathione, methionine or sulfur-containing derivatives of methionine by plant cells, said method consisting of

culturing plant cells transformed with a nucleic acid sequence encoding an *Arabidopsis thaliana* cysteine-insensitive serine acetyltransferase operably linked to heterologous 5' and 3' regulatory sequences that are functional in plants;

whereby said transformed plant cells overexpress serine acetyltransferase, resulting in an increase in production of cysteine, glutathione, methionine, or sulfur-containing derivatives of

methionine by said transformed plant cells in comparison with the level observed in nontransformed plant cells of the same type as said transformed plant cells.

Claim 80 (currently amended): A method for increasing the production of cysteine, glutathione, methionine or sulfur-containing derivatives of methionine by a plant, said method consisting of

culturing plant cells transformed with a nucleic acid sequence encoding an Arabidopsis thaliana cysteine-insensitive serine acetyltransferase operably linked to heterologous 5' and 3' regulatory sequences that are functional in plants; and

regenerating a transformed plant from said transformed plant cells,

whereby said transformed plant overexpresses serine acetyltransferase, resulting in an increase in production of cysteine, glutathione, methionine, or sulfur-containing derivatives of methionine by said transformed plant in comparison with the level observed in a nontransformed plant of the same type as said transformed plant.

Claim 81 (new): The method according to claim 48, wherein the plant cells are from a plant selected from the group consisting of cereals, sugar cane, rice, maize, tobacco, soybean, rape, cotton, beet and clover.

Claim 82 (new): The plant according to claim 55, wherein the plant is selected from the group consisting of cereals, sugar cane, rice, maize, tobacco, soybean, rape, cotton, beet and clover.

IN THE TITLE:

A METHOD OF INCREASING SULPHUR COMPOUNDS AND IN PARTICULAR
OF CYSTEINE, METHIONINE AND GLUTATHIONE IN PLANTS AND PLANTS
OBTAINED

3. With respect to the usage of the word "heterologous" in claims 34 and 78-80, the rejection made in the Office action of 17 June 2002, was withdrawn in the Office action of 29 April 2003.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (571) 272-0801. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (571) 272-0804. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

Patent applicants with problems or questions regarding electronic images that can be viewed in the Patent Application Information Retrieval system (PAIR) can now contact the USPTO's Patent Electronic Business Center (Patent EBC) for assistance. Representatives are available to answer your questions daily from 6 am to midnight (EST). The toll free number is (866) 217-9197. When calling please have your application serial or patent number, the type of document you are having an image problem with, the number of pages and the specific nature of the problem. The Patent Electronic Business Center will notify applicants of the resolution of the problem within 5-7 business days. Applicants can also check PAIR to confirm that the problem has been corrected. The USPTO's Patent Electronic Business Center is a complete service center supporting all patent business on the Internet. The USPTO's PAIR system provides Internet-based access to patent application status and history information. It also enables applicants to view the scanned images of their own application file folder(s) as well as general patent information available to the public.

For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.

Anne R. Kubelik, Ph.D.
October 27, 2004



ANNE KUBELIK
PATENT EXAMINER